

IV. REMARKS

Claims 1-22 are pending in this application. By this amendment, claims 1, 8, and 16 have been amended. Applicants do not acquiesce in the correctness of the rejections and reserve the right to present specific arguments regarding any rejected claims not specifically addressed. Further, Applicants reserve the right to pursue the full scope of the subject matter of the original claims in a subsequent patent application that claims priority to the instant application. Reconsideration in view of the following remarks is respectfully requested.

In the Office Action, claim 1-22 are rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Chiu *et al.* (U.S. Patent No. 6,584,606 B1), hereafter "Chiu." Applicants assert that Chiu does not teach each and every feature of the claimed invention. For example, with respect to independent claims 1, 8 and 16, Applicants submit that Chiu fails to teach a control file that includes a proposed placement of a set of I/O pad groups on the chip. The passage of Chiu cited by the Office teaches a proposed I/O design that "...includes such characteristics as the designer's intended load on the I/O cells, the switching factor, I/O duty cycle, the temperature at which the design is proposed to operate, and a proposed operational lifetime in terms of thousands of power on hours (KPOH)." Col. 6, lines 16-20. To this extent, the proposed I/O design used by input by Chiu describes overall design characteristics of a chip but does not indicate that its I/O cells on the chip are organized into I/O cell groups or the proposed placement of these I/O cell groups. See also col. 5, line 61 through col. 6, line 5. Nowhere in the passage cited by the Office or elsewhere does Chiu teach a proposed placement of groups of its I/O cells. In contrast, the present invention includes "...a control file that includes a proposed placement of a set of I/O pad groups on the chip." Claim 1. As such, the control file of the claimed

invention does not merely include overall chip characteristics or individual I/O cells as does proposed I/O design of the input of Chiu, but rather includes a proposed placement of a set of I/O pad group on the chip. Thus, the proposed I/O design that is used as input in the Chiu does not teach the control file of the claimed invention. Accordingly, Applicants respectfully request that the Office withdraw its rejection.

With further respect to independent claims 1, 8, and 16, Applicants respectfully submit that Chiu also fails to teach a calculation system for calculating a group switching current of a particular I/O pad group identified in the control file based on individual switching currents of each I/O pad in the particular I/O pad group, and for comparing the group switching current to a predetermined maximum switching current. One of the passages of Chiu cited by the Office teaches that "[t]he proposed placement of one I/O cell may affect other cells, as groups of cell placement slots may be supplied by the same power distribution wiring, and this may limit the total current draw of all the I/O cells placed in that group." Col. 6, lines 12-15. However, even though Chiu acknowledges power limits causing the placement of an I/O cell to affect other I/O cells in a group, Chiu never teaches that its checking program specifically checks for this, but instead for IR voltage drop, electromigration (EM) limits, and noise limit rules. See col. 5, lines 42-55; col. 6, lines 55+. To this extent, the LIM1, LIM2 and LIM3 limits specified by Chiu in Table 1 and described in col. 9, lines 40-59 as cited by the Office, do not describe limits of the switching current of a group, but only "...a parameter, such as EM and di/dt noise." Col. 9, lines 38-39.

The Office further argues that "...electromigration analysis inherently incorporates calculating switching currents both individual and group." Office Action, page 3. Applicants

assert that this statement amounts to Official Notice. Applicants further assert that the Office's factual assertion, i.e., that there is no method for determining electromigration without calculating a group switching current of a particular I/O pad group based on individual switching currents of each I/O pad, is not properly based upon common knowledge. Accordingly, Applicants respectfully request that the Office support the finding with references that show this feature or withdraw the rejection.

The claimed invention, in contrast, includes "...a calculation system for calculating a group switching current of a particular I/O pad group identified in the control file based on individual switching currents of each I/O pad in the particular I/O pad group, and for comparing the group switching current to a predetermined maximum switching current." Claim 1. As such, the calculation system of the claimed invention, rather than determining other factors such as IR voltage drop, electromigration (EM) limits, and noise limit rules as does Chiu, instead calculates a group switching current of a particular I/O pad group. Furthermore, unlike Chiu in which the limits are for a parameter, such as EM and di/dt noise, the comparing of the claimed invention is to a predetermined maximum switching current. For the above reasons, the calculation system of the claimed invention is not taught by Chiu. Accordingly, Applicants request that the rejection be withdrawn.

With respect to dependent claims 4, 12, and 19, Applicants respectfully submit that Chiu also fails to teach that the corrective action system inserts an additional power pad into the particular I/O pad group if the group switching current exceeds the predetermined maximum switching current. The passage of Chiu cited by the Office includes a checking program that may show cells that exceed the limit rules, may show a new proposed design, and may allow the

designer to dynamically change I/O cell types and move the proposed I/O cells into new locations. Col. 7, line 13 through col. 8, line 14. However, nowhere in the passage cited by the Office or elsewhere does Chiu teach that its checking program inserts an additional power pad into a particular pad group. In contrast, the claimed invention includes "...wherein the corrective action system inserts an additional power pad into the particular I/O pad group if the group switching current exceeds the predetermined maximum switching current." Claim 4. As such, in contrast to Chiu, the corrective action system of the claimed invention inserts an additional power pad into the particular I/O pad group. Thus, the checking program of Chiu does not teach the corrective action system of the claimed invention. Accordingly, Applicants respectfully request withdrawal of the rejection.

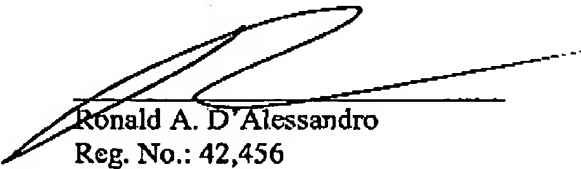
With regard to the Office's other arguments regarding dependent claims, Applicants herein incorporate the arguments presented above with respect to independent claims listed above. In addition, Applicants submit that all dependant claims are allowable based on their own distinct features. However, for brevity, Applicants will forego addressing each of these rejections individually, but reserve the right to do so should it become necessary. Accordingly, Applicants respectfully requests that the Office withdraw its rejection.

V. CONCLUSION

In light of the above, Applicants respectfully submits that all claims are in condition for allowance. Should the Examiner require anything further to place the application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the number listed below.

Respectfully submitted,

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